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Elm Bark BEETLES

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UNITED STATES DEPARTMENT OF AGRICULTURE

ELM BARK BEETLES

Prepared by the Division of Forest Insect Research, Forest Service [1]

TWO KINDS OF BARK BEETLES commonly attack elm trees in the United States. One is known as the smaller European elm bark beetle (*Scolytus multistriatus*) and the other as the native elm bark beetle (*Hylurgopinus rufipes*). So far as is known, these bark beetles attack elm only. They are important forest and shade-tree pests principally because they spread the fungus causing the Dutch elm disease.

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[1] Revision prepared by R. R. Whitten.

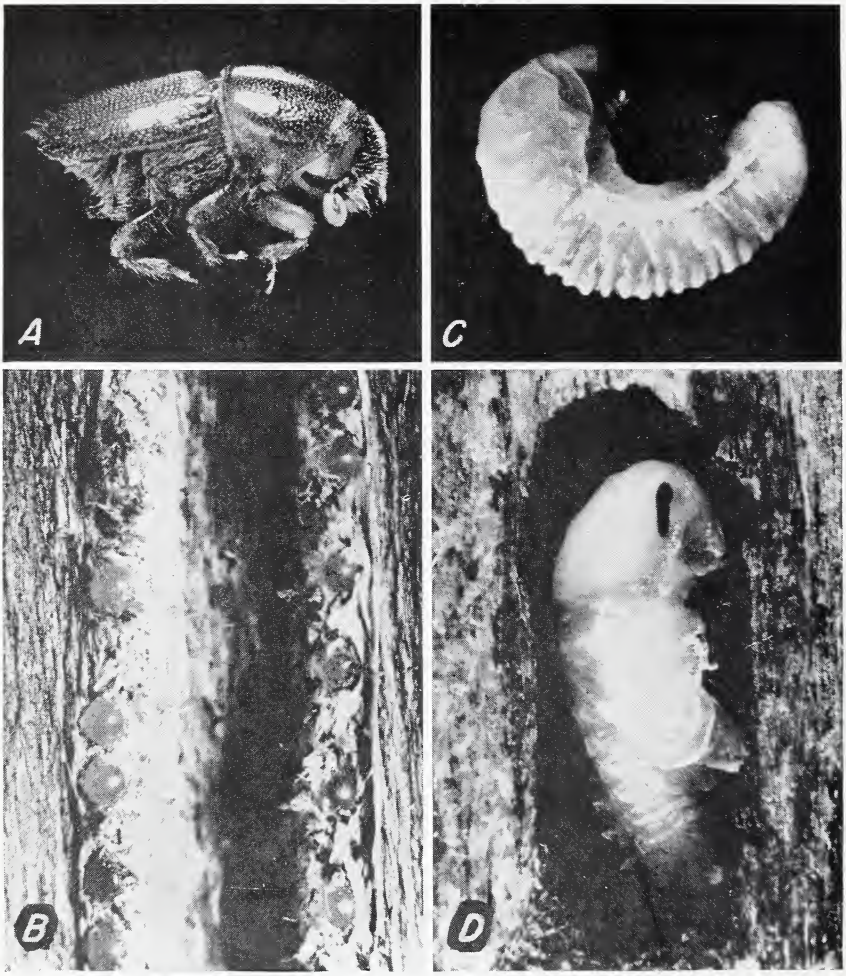

Figure 1.—The smaller European elm bark beetle: *A*, Adult; *B*, eggs; *C*, larva; *D*, pupa.

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THE SMALLER EUROPEAN ELM BARK BEETLE

The smaller European elm bark beetle is, as its name implies, a native of Europe. It is known to have been present in the vicinity of Boston, Mass., as early as 1904. Since then it has been found in most of the States east of the Mississippi River, and in Iowa, Missouri, Arkansas, Louisiana, Texas, Oklahoma, Kansas, Nebraska, South Dakota, Colorado, New Mexico, Utah, Nevada, Oregon, California, and Ontario, Canada.

How this bark beetle became established in the United States is not known. It has been found in burl elm logs consigned to veneer plants and in elm sticks used as crate material in cargoes arriving from Europe. Presumably, therefore, the insect first gained a foothold in one of these ways. Its subsequent spread is believed to have been aided by shipments of similar infested material originating both in Europe and in the United States. Infested material has also been carried by rivers, especially when they have been at flood stage. The beetles are capable of flying several miles and are probably carried much farther by wind currents.

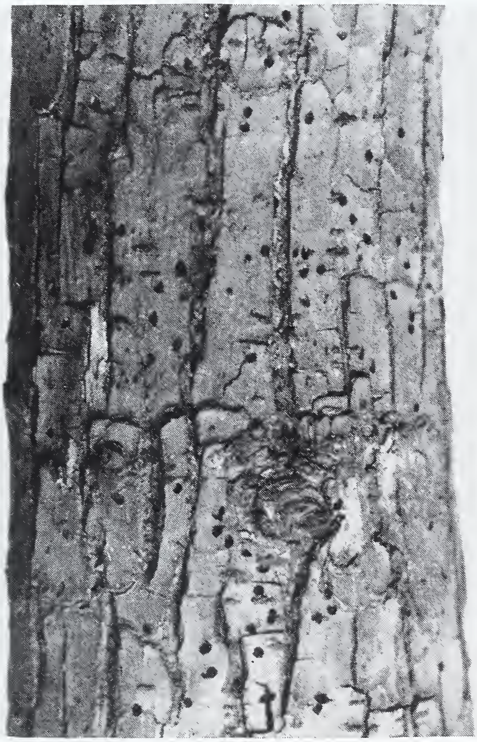

Figure 2.—Emergence holes made by adults of the smaller European elm bark beetle in elm bark. Natural size.

DESCRIPTION

The adult beetle (fig. 1, *A*) is dark reddish brown, shining, and approximately ⅛ inch long. The under side of the hind end of the body is concave, with a noticeable projection or spine. The minute egg (fig. 1, *B*) is globular, shining, and pearly white. The larva (fig. 1, *C*) is a legless white grub with a brown head; it is about ⅛ inch long when full-grown. The pupa (fig. 1, *D*) is of approximately the same size as the adult but is white.

LIFE HISTORY

These bark beetles pass the winter as larvae in the bark. When warm weather comes in the spring, the larvae complete their growth and transform to pupae and later to adult beetles. The adults begin issuing about the middle of May through holes that they make in the bark (fig. 2). They continue to emerge during the warm months. The adults feed in the crotches of living elm twigs (fig. 3) and, if carrying the Dutch elm disease fungus, may in this manner introduce it into healthy elm trees. Later they bore through the bark of recently cut, dead, or dying elm material. They form galleries in the inner bark, grooving the surface of the wood parallel with the grain.

The female places her eggs in niches along the sides of the gallery (fig. 1, *B*). The larvae that hatch from these eggs feed in the inner bark and the surface of the wood, and in so doing construct mines that extend at an angle from the egg gallery (fig. 4). When full-grown the larvae build cells in the bark and there transform to pupae. In New Jersey eggs laid during the spring and early in the summer develop into adults in the same season, but the larvae that overwinter usually develop from eggs laid late in the summer or early in the fall.

Sometimes these beetles form galleries in trees that are too vigorous for the development of the larvae. They may pierce the bark only or make short galleries. Repeated attacks of this nature may eventually kill the tree.

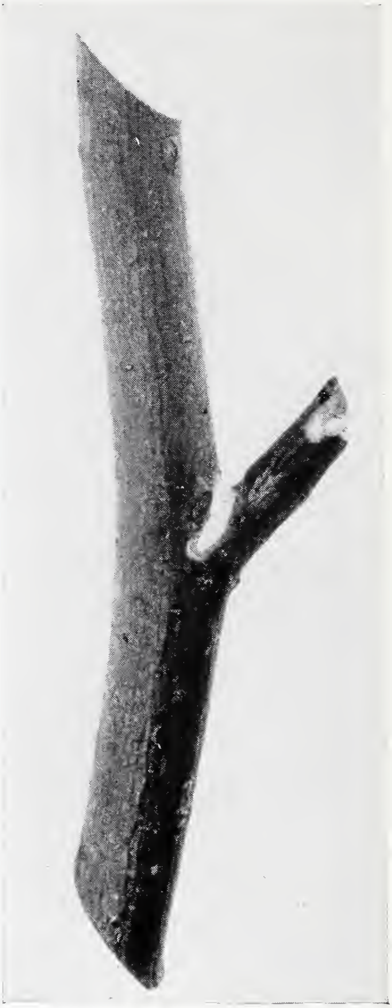

Figure 3.—Feeding scar in small elm crotch, made by the smaller European elm bark beetle. Enlarged.

In their search for suitable elm material in which to lay their eggs, these beetles may fly several miles and may carry with them the Dutch elm disease fungus. When introduced into dead or dying elm wood, this fungus may become established. The spores of this fungus adhere readily to the bodies of the issuing

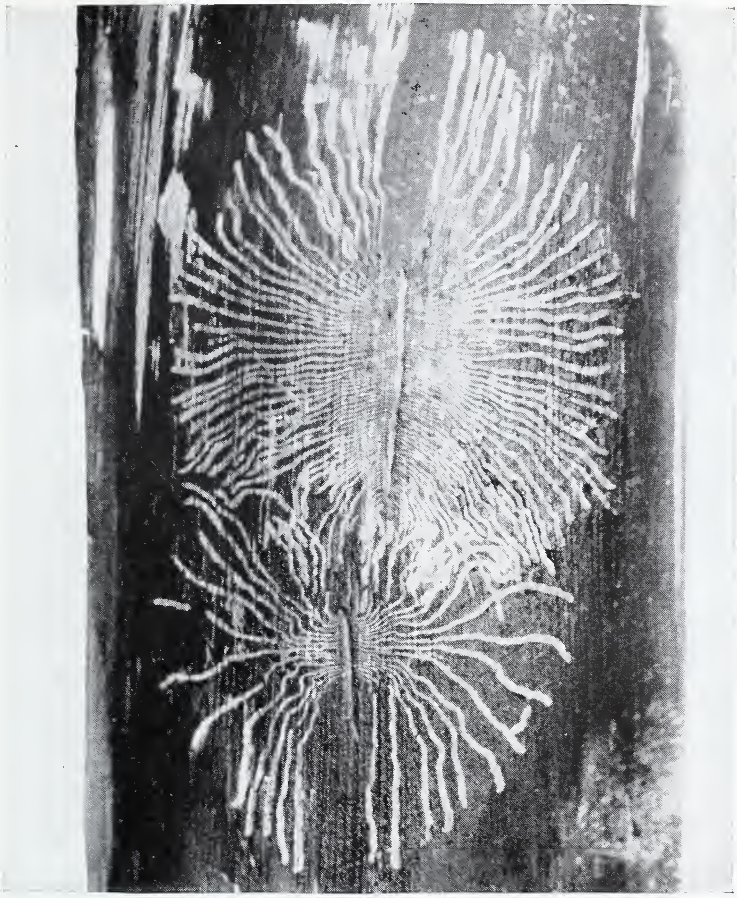

Figure 4.—Egg galleries and larval mines of the smaller European elm bark beetle on surface of wood. One-half natural size.

beetles and may be carried to healthy elms.

THE NATIVE ELM BARK BEETLE

The native elm bark beetle presumably originated in the United States. This insect occurs in the Eastern States from Maine to Virginia, Mississippi, Kansas, and Minnesota, and has been recorded in nearly all the intervening States. It has also been reported from Ontario, Canada. It may be present throughout the natural range of the American elm, or approximately the eastern two-thirds of the country.

DESCRIPTION

The adult beetle (fig. 5) is brown and a little less than 1/8 inch long. It can be distinguished from the European species by its less shiny or duller appearance and by the absence of the concave outline and the spine near the hind end of the under surface (fig. 1, *A*). The egg, larva, and pupa closely resemble those of the European elm bark beetle in color and general appearance.

LIFE HISTORY

These bark beetles pass the winter both as larvae in elm bark and as adults. Most of the adults overwinter in tunnels that they have made in the bark of healthy elm trees (fig. 6). They begin to appear in May and make their egg galleries in the same kind of elm material as do the smaller European elm bark beetles. However, these galleries extend across the grain of the wood (fig. 7) instead of parallel with it, and can thus be distinguished from the egg galleries of the smaller European elm bark beetle. An egg gallery of the native elm bark beetle usually consists of two branches diverging from the point where the parent beetles penetrated the bark.

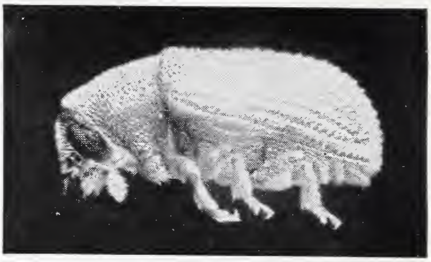

Figure 5.—Adult of the native elm bark beetle. Enlarged.

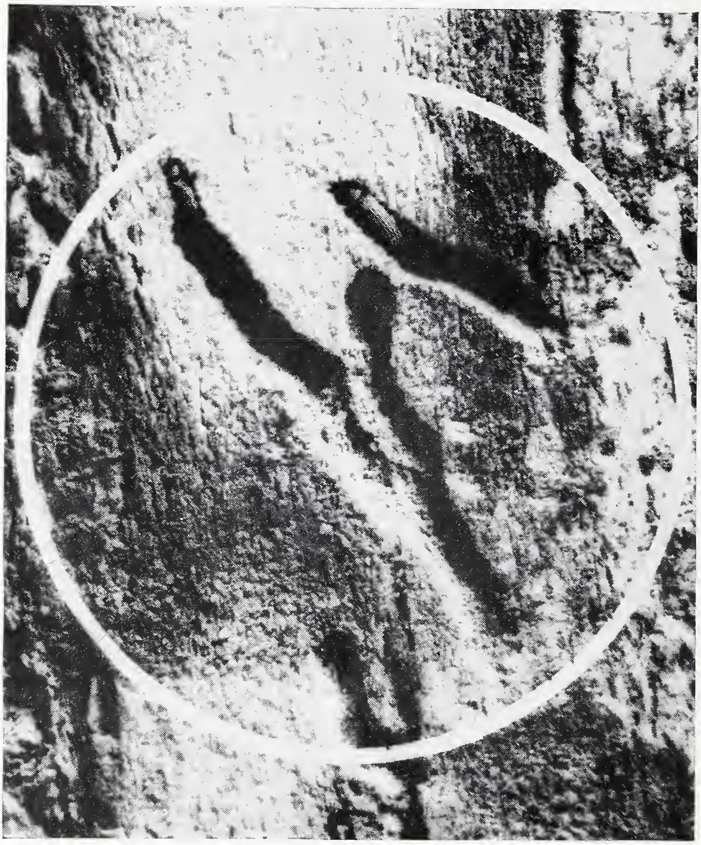

Figure 6.—Hibernating galleries in bark of elm containing adults of the native elm bark beetle. Enlarged.

NATURAL CHECKS TO ELM BARK BEETLES

Elm bark beetles have various natural enemies. Other insects destroy these beetles and diseases play a part in reducing their numbers. Certain birds remove the immature stages from the bark and use them as food, especially during the winter. Low winter temperatures kill many. The egg galleries may be so numerous that only a small percentage of the eggs that are laid develop into adults. Nevertheless, the elm bark beetles persist in large numbers in localities where there is an abundant supply of suitable food for the larvae.

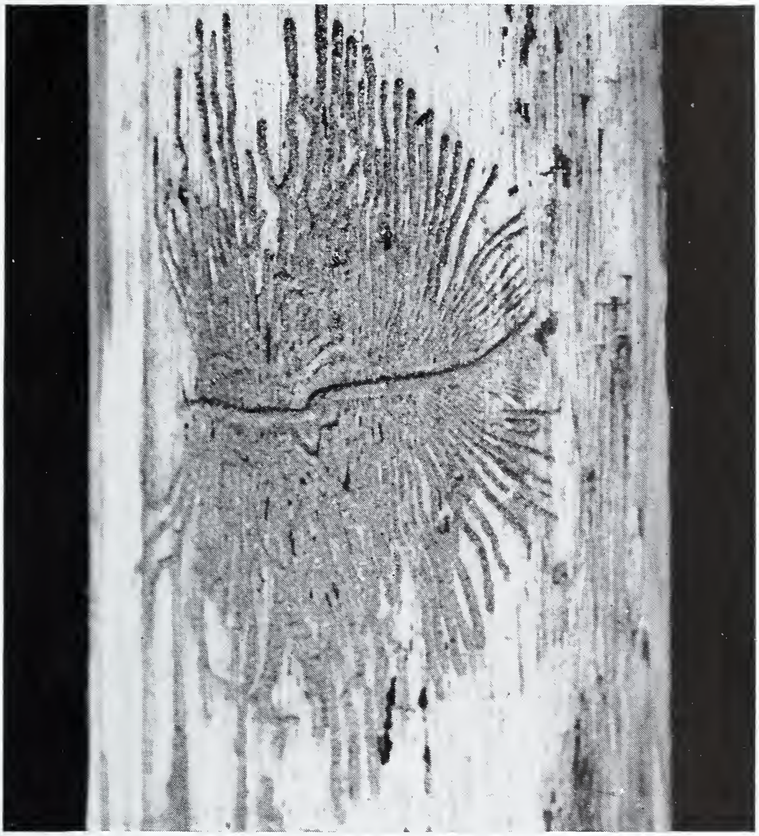

Figure 7.—Egg galleries and larval mines of the native elm bark beetle on surface of wood. Three-fifths natural size.

BARK BEETLES AND DUTCH ELM DISEASE

Unless these elm bark beetles are associated with Dutch elm disease, there is usually little need for control measures. Elm trees that are kept in good vigorous condition are not subject to serious damage by these beetles.

When elm leaves suddenly wilt, become yellow or dry, and then drop off, the tree may have Dutch elm disease. If your elm trees show these symptoms, cut off several small branches with the affected leaves and look for a brown discoloration in one or more of the annual rings of the wood. If you find this brown color, send four or more branches about 6 inches long to your State agricultural experiment station for a laboratory diagnosis.

CONTROL MEASURES

The only methods proven effective in reducing losses from the Dutch elm disease are those directed at the principal bark beetle carriers. These methods are: (1) To prevent feeding in healthy elms by the adult beetles, and (2) to destroy the bark beetle breeding places.

TREATMENT OF HEALTHY ELMS

The most effective method known to prevent the bark beetles from feeding in healthy elms is to thoroughly spray all bark surfaces, especially the smaller branches and twigs in the crown. For most effective coverage these sprays should be applied when the tree is dormant. At this time spraying is also less likely to affect birds, other wildlife, and beneficial insects adversely.

For many years DDT has been used in sprays to prevent bark beetle feeding. It has, however, occasionally had adverse effects on wildlife. Fortunately, another material, methoxychlor, is as effective as DDT and according to the U.S. Fish and Wildlife Service, is less hazardous to birds, fish, and wild animals. Nevertheless, it should be handled with care (see "Precautions").

Use any commercially prepared emulsifiable concentrate of methoxychlor. (A concentrate with a xylene base is less likely to injure elm leaves than one without xylene.) For use in hydraulic spray equipment, dilute with water to make a spray containing 2 percent methoxychlor, by weight.

For use with mist blower equipment a 6 or 12 percent spray may be used. Either concentration is effective in preventing beetle feeding, but the 6 percent spray requires more thorough coverage of all bark surfaces and so demands greater care in spraying. One application a year during dormancy of the trees is sufficient.

TREATMENT OF BREEDING PLACES

The second method of controlling elm bark beetles is to destroy their breeding places promptly. Both species breed only in dead or dying elm wood with bark intact such as broken limbs, woodpiles, recently felled trees, or those that have died rapidly from disease or other causes. The dead trees must be cut at ground level. All such material should be burned. Since these beetles are capable of flying several miles, this method of control must be applied throughout relatively large areas to be fully effective.

PRECAUTIONS IN HANDLING INSECTICIDES

Handle methoxychlor concentrates and solvents carefully. Follow directions on labels exactly and take all precautions listed. The concentrates are poisons. The solvents, including acetone, are flammable and their fumes may be toxic. Keep them away from fire. Do not inhale the fumes or spray. If you spill any of the concentrate on the skin, wash with soap and water.

Do not let the spray get into bird baths or fish pools. Do not let it form puddles beneath the trees or along street curbs where birds may come to drink. Keep children and animals away when spraying. Do not contaminate streams or ponds. Keep stored chemicals out of reach of children, animals, or birds.

PROTECT

Use Pesticides Safely

FOLLOW THE LABEL

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